School of Oriental and African Studies **University of London**

Department of Economics

Preliminary Statistics **September 2013**

Problem Set 1: Descriptive Statistics

1. Use the summation operator to

   (a) calculate the following:
   (i) $\sum_{i=1}^{4}(i+4)$ (ii) $\sum_{i=1}^{n} 2$ (iii) $\sum_{i=1}^{3} 3^i$

   (b) express the following in $\sum$ notation:
   i. $X_1 + 2X_2 + 3X_3 + 4X_4 + 5X_5$
   ii. $(X_1 + Y_1) + (X_2 + Y_2) + ... + (X_k + Y_k)$

2. A new degree was introduced in the Department of Economics. The performance of the first cohort of students was very disappointing and the teaching was reorganised. Data on the performance of the first and second cohorts is given in the table below. Calculate means, medians and modes for the two cohorts. Do you think that the reorganisation of teaching improved academic standards?

Class	*Mark*	*Percentages Cohort* 1	*Percentages Cohort* 2
1	70	20	0
2.1	60	0	0
2.2	50	20	40
3	40	20	20
Pass	30	0	20
Fail	20	40	20

3. The fuel consumption of 8 cars was checked by driving each car around a test course and measuring the amount of fuel used. The results for the 8 cars were (in miles per gallon):

27	31	24	33	29	34	30	26

(a) Calculate the mean and median for these sample values.

(b) Calculate the sample variance and standard deviation.

4. A stratified random sample of 100 graduates working in banking is taken from a population of 1000. The sample is stratified on gender: a random sample of 50 graduates is from taken the 200 female population and a random sample of 50 graduates is taken from the 800 male population. The total income reported by the female sample was 1,100,000, and for the male sample 1,400,000. Calculate an estimate of the overall average income.